

Recovery Plan Action Status

Plan Name: Fishes of the Rio Yaqui (4 spp.)

Plan Status: Final

Plan Date: 29-Mar-95

Lead Agency: USFWS

Lead Office: San Bernardino National Wildlife Refuge

(364-2104)

| Species | Action Priority # | Action # | Action Description | Action Status | Est. Initiation Date | Est. Completion Date | Responsible Parties | Work Type | Labor Type | Action Comments |
|---|-------------------|----------|---|-----------------|----------------------|----------------------|--|----------------------------|-----------------------------|---|
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 1 | 1.1 | Pursue agreements and development of management plans for long-term survival of fishes of concern in Mexico | Not Started | | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 2 | 1.2 | Develop and implement cooperative management plans | Not Started | | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 2.1 | Determine aquifer recharge zone, capacities and configuration, and characteristics of sub-surface flow | Complete | FY 1995 - FY 1999 | FY 2000 - FY 2004 | Arizona Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Contract | Earman et al. 2003. "An investigation of the properties of the San Bernardino groundwater basin, Arizona and Sonora, Mexico." |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 1 | 2.2 | Protect watershed and aquifer | Ongoing Current | FY 2000 - FY 2004 | | U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Acquisition: General | Internal Administrative | Cooperation with adjacent landowners in both Arizona and Sonora. Aquifer monitoring on both public and private lands in the U.S. and Mexico |

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| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 2 | 2.3 | Determine amounts of water required to maintain listed species at San Bernardino/Leslie Canyon NWR | Ongoing Current | FY 1995 - FY 1999 | | U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 2.4 | Revise and continue implementation of Refuge Master Plan | Ongoing Current | FY 1995 - FY 1999 | | U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Management: Planning | Contract | USFWS, 1995. "San Bernardino and Leslie Canyon NWRs Comprehensive Management Plan 1995 -2015." This plan is currently being updated as the refuge began work on its Comprehensive Conservation Plan in 2009. |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 2 | 2.4.1 | Develop water-use plan for San Bernardino/Leslie Canyon NWR | Not Started | | | USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 2.4.2 | Develop management plan for each species of concern | Partially Complete | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | |

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| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 2 | 2.4.3 | Develop and implement genetic monitoring plans and schedules for each species | Ongoing Current | FY 2000 - FY 2004 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Research: Genetics | Internal Technical Assistance | Genetic monitoring schedule set up every 5 years after baseline. Baseline never completed. A grant was secured by San Bernardino NWR and paid to Dexter National Fish Hatchery in the amount of \$7,500 to conduct genetic analysis on <i>Ictalurus pricei</i> . Unofficial report shows pure yaqui catfish (January 2010) |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 1 | 2.6 | Eradicate and secure against reinvasion of new introductions of non-indigenous species | Ongoing Current | Prior to FY 1995 | | U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Management: Predator and Competitor Control | Internal Field Assistance | Continued removal of invasive predator (<i>Lithobates catesbeiana</i>) at several ponds |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 2 | 3.1 | Examine and document life histories | Not Started | | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | |

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| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 3 | 3.2 | Determine impacts of intra- and interspecific interactions in habitats occupied by combinations of species | Not Started | | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 3 | 3.3 | Determine habitat requirements and habitat utilization | Partially Complete | FY 2007 | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Internal Field Assistance | Hay Hollow Ponds Study (see action 2.5) |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 1 | 3.4 | Determine and delineate genetic composition of existing populations | Not Started | | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Research: Genetics | Internal Technical Assistance | See 2.4.3 catfish DNA analysis |

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| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 2 | 3.5 | Monitor health of fish populations and occupied habitats | Ongoing Current | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, Centro Ecologico de Sonora, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Research: Population Surveys | Internal Field Assistance | <p>Estimated costs for this are \$9000 annually. The numbers for estimated costs do not reflect this or show that this is an annual population survey and has been ongoing since the approval of the recovery plan in 1995.</p> <p>Included in this annual monitoring is HCP monitoring for the El Coronado Ranch at Turkey Creek in the Chiricahua Mountains and supplemental monitoring of the Douglas High School Pond, 99 Bar Ranch, and the Bar Boot Ranch.</p> <p>For annual monitoring on San Bernadino NWR and Leslie Canyon NWR in 2010 Proportion of Habitat Occupied (PHO) for Gila purpurea was .51291 for all impoundments, up from .50858 in 2008, and .75246 for Poeciliopsis sonoriensis, down from .88925.</p> <p>Ictalurus pricei were captured all three of the three known impoundments in for the first time since 2004; House Pond, at the Slaughter Ranch; Twin Pond on SBNWR; and Big Tank at El Coronado Ranch.</p> <p>In addition to the</p> |

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| | | | | | | | | | | <p>annual monitoring the refuge also monitors for infestation rates of Asian tapeworm in <i>G. purpurea</i>. Rates from current monitoring show an 70% rate of occurrence in sampled fish and a 100% rate of occurrence in wetlands surveyed. Even with these rates of occurrence it is believed that Asian tapeworm is having very little, if any effect on survivability of <i>G. purpurea</i>, based on data from annual monitoring.</p> <p><i>Cyprinella formosa</i> are now found in four impoundments on SBNWR and monitoring showed breeding had taken place in two of the four impoundments.</p> <p>Monitoring at the Bar Boot Ranch has not occurred this year due to salvage efforts from the Chiricahua Mountains in response to the Horseshoe 2 Fire. 1200 <i>G. purpurea</i> were relocated to the ranch from El Coronado. There were no <i>P. sonoriensis</i> observed.</p> <p>A report on the monitoring of El Coronado Ranch is available from the Fish and Wildlife Conservation Office in Pinetop.</p> <p>No report has been</p> |

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| | | | | | | | | | | obtained for Mexican populations. |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 1 | 4.1 | Maintain levels and quality of subsurface waters | Ongoing Current | Prior to FY 1995 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Management: Habitat Maintenance and Manipulation | Internal Field Assistance | Several monitoring wells, on San Bernardino NWR and in the Leslie Canyon Watershed, are monitored monthly to maintain ground water levels necessary for fish survival. Aquifer water chemistry testing done quarterly on refuge and adjacent private land. |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 2 | 4.1.1 | Apply proper or enhanced land-use practices | Not Started | | | USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 2 | 4.1.2 | Exclude development such as mining or irrigated agriculture | Ongoing Current | | | U.S. Fish and Wildlife Service, Ecological Services Division, Arizona Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Acquisition: Easement, Acquisition: Management Agreement, Management: Land Use | Internal Field Assistance | Several easements have been acquired within the Leslie Canyon Watershed to protect upstream habitat and to ensure adequate water for the Leslie Canyon NWR. In addition several HCPs and SHAs have been inacted to provide additional habitat for these species. (El Coronado HCP, Malpais Borderlands Group HCP, and Leslie Creek Watershed SHA) |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 1 | 4.1.3 | Forge agreements to assure aquifer water quality | Not Started | | | U.S. Fish and Wildlife Service, Ecological Services Division, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |

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| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 1 | 4.2 | Work with water users and appropriate agencies and individuals to prevent overuse of water from essential aquifers | Ongoing Current | | | U.S. Fish and Wildlife Service, Ecological Services Division, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Internal Field Assistance | |
| Yaqui catfish (Ictalurus pricei) | 2 | 4.3 | Obtain In stream flow water-rights for sufficient water to maintain surface flows in watercourses important to recovery | Partially Complete | Prior to FY 1995 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | 1993 Leslie Creek in-stream flow water right acquired by USFWS. |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 2 | 4.4 | Acquire and protect or protect through conservation agreements and habitat management plans the essential waters and habitats needed for long-term survival of fishes of concern | Partially Complete | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Internal Administrative, Internal Field Assistance | 2001 USFWS Conservation Easement on 11,585-acre 99-Bar Ranch. 2005 USFWS Conservation Easement on increment of 13,713-acre Bar-Boot Ranch. In 2009 1,757.8 acres of the 13,713 acre Bar-Boot Ranch put into USFWS Conservation Easement. Arizona Fish and Wildlife Conservation Office with the assistance of the refuge is developing a Rio Yaqui Fish Management Plan. |

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| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 5.1 | Identify areas for possible reintroductions | Ongoing Current | FY 2006 | | Arizona Department of Game and Fish, U.S. Geological Survey, New Mexico Department of Game and Fish, Bureau Land Management, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Internal Field Assistance | Several sites have been identified for the reintroduction Poeciliopsis sonoriensis, Gila purpurea, and Cyprinella formosa into upstream habitats of Leslie Canyon NWR |
| Yaqui catfish (Ictalurus pricei) | 3 | 5.2 | Develop culture techniques for Yaqui catfish | Partially Complete | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | Determined at Uvalde NFH in 1996 but not published or duplicated. |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 5.2.1 | Develop breeding protocol | Partially Complete | FY 2005 | | U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | Protocol developed by UofA for Yaqui chub and Yaqui topminnow. Not yet refined for Yaqui catfish or Yaqui beautiful shiner. |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 5.2.2 | Determine fish size, time of year and stocking densities required to ensure survival | Ongoing Current | FY 2007 | | U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Internal Field Assistance | Hay Hollow Study has been completed. Final report is available at the Refuge Headquarters. |

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| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 3 | 5.2.3 | Stock and monitor success of reintroductions | Partially Complete | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Internal Field Assistance | See above |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 3 | 5.3 | Reintroduce, reestablish and monitor populations of other species of concern | Partially Complete | FY 2000 - FY 2004 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Internal Field Assistance | Malcom et al. 2003. "San Bernardino springsnail population ecology and habitat Needs." AGFD Heritage Grant I02004. Chiricahua leopard frog monitoring in Leslie Canyon conducted three times a year starting in 2009. Yellow-billed cuckoo monitoring taking place on San Bernardino NWR Jun-Jul. Annual monitoring of Huachuca water umbel on San Bernardino and Leslie Canyon NWR. |
| Yaqui catfish (<i>Ictalurus pricei</i>), Yaqui chub (<i>Gila purpurea</i>), Beautiful shiner (<i>Cyprinella formosa</i>) | 3 | 6.1 | Develop comprehensive programs of information and education | Ongoing Current | FY 2000 - FY 2004 | | U.S. Fish and Wildlife Service, Ecological Services Division, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2, Fishery Resources Program | Work type not yet selected | Labor type not yet selected | |

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| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 6.2 | Insure broad dissemination of information in both English and Spanish | Partially Complete | FY 2006 | FY 2000 - FY 2004 | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | Bilingual educational signs from Wilderness Graphics installed at five locations in Arizona and Sonora. |
| Yaqui catfish (Ictalurus pricei), Yaqui chub (Gila purpurea), Beautiful shiner (Cyprinella formosa) | 3 | 6.3 | Establish and maintain archives of published and unpublished materials relevant to aquatic organisms and aquatic habitats of concern in permanent depositories | Ongoing Current | FY 1995 - FY 1999 | | Arizona Department of Game and Fish, New Mexico Department of Game and Fish, U.S. Fish and Wildlife Service, Division of Refuges and Wildlife, USFWS Regional Office 2 | Work type not yet selected | Labor type not yet selected | |